Name: Date:

Polynomial Factoring solution (version 620)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 45 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(45)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 180}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-80}}{2}$$

$$x = \frac{-10 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-10 \pm 4\sqrt{5}\, i}{2}$$

$$x = -5 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 - 7i$ and $-6 - 3i$ in standard form $(a + bi)$.**

Solution

$$(9 - 7i) \cdot (-6 - 3i)$$

$$-54 - 27i + 42i + 21i^2$$

$$-54 - 27i + 42i - 21$$

$$-54 - 21 - 27i + 42i$$

$$-75 + 15i$$

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3. **Write function $f(x) = x^3 - 7x^2 - 14x + 120$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-7	-14	120
-4		-4	44	-120
	1	-11	30	0

$$f(x) = (x + 4)(x^2 - 11x + 30)$$

$$f(x) = (x + 4)(x - 5)(x - 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 3) \cdot (x - 2) \cdot (x - 6)^2$$

Sketch a graph of polynomial $y = p(x)$.